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(54) Abstract Title: **Sealing end of joist**

(57) A sealing apparatus 14 for mounting an end of a joist within a wall 12, including a sleeve 16 for receiving the end of the joist and configured for location in an aperture through the wall, and means such as flange 30 for creating a seal against the wall to prevent passage of air through the aperture adjacent the joist, e.g. if the joist were to shrink with age. In other embodiments, a two part telescopic device for differing wall thicknesses has a flange at each end, optionally with one flange in the form of discrete tabs (Figs 4 and 10, not shown), a device has a break-out portion to receive a joist strap (Fig 8, not shown), and other variants lack the sleeve, either fitting around the joist (Fig 5, not shown) or abutting its end (Figs 14, 16 and 18, not shown).

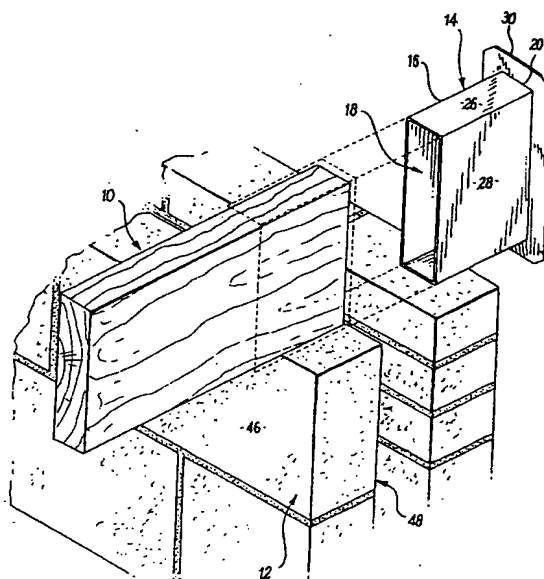


Fig 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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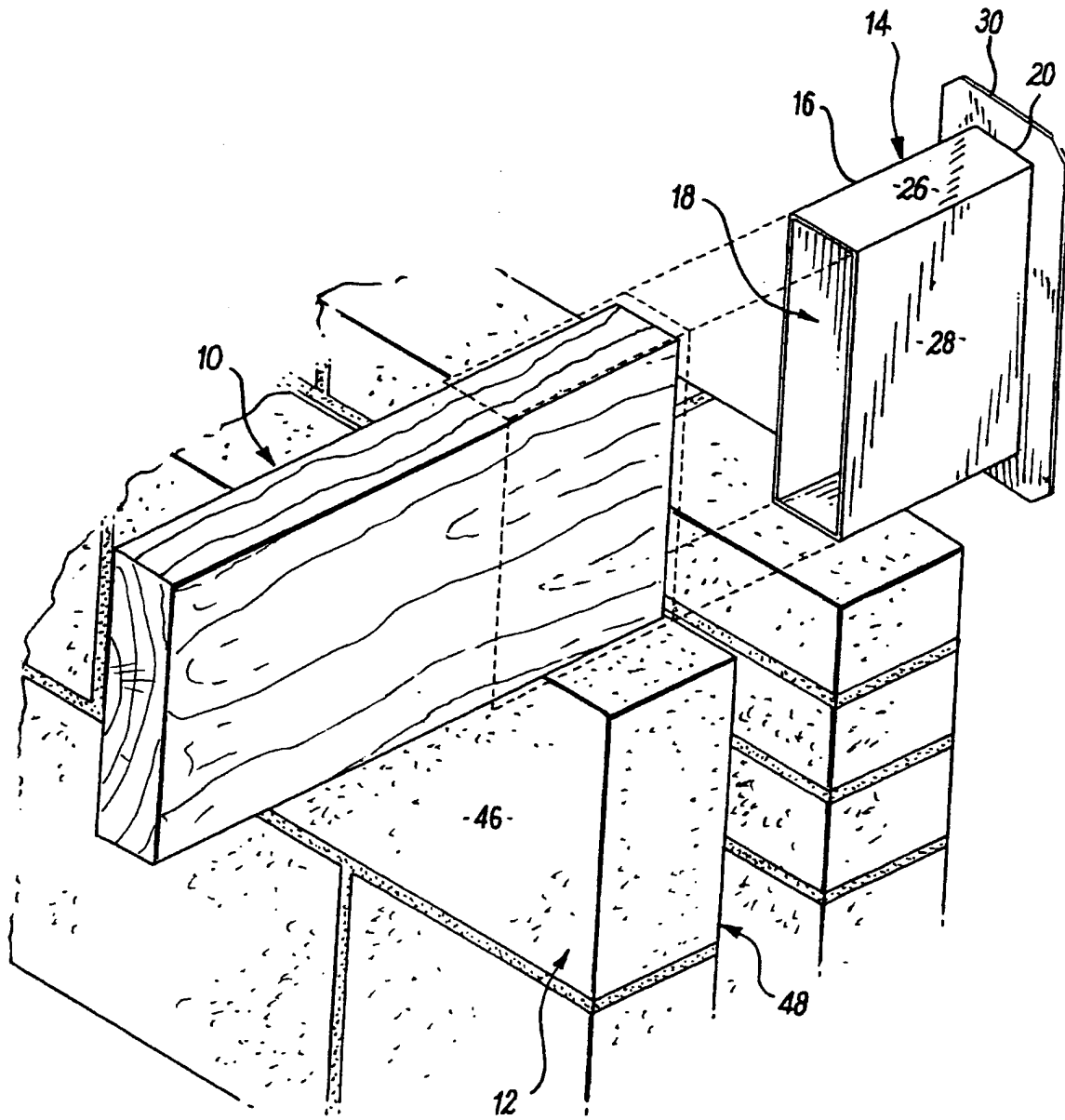


FIG. 1

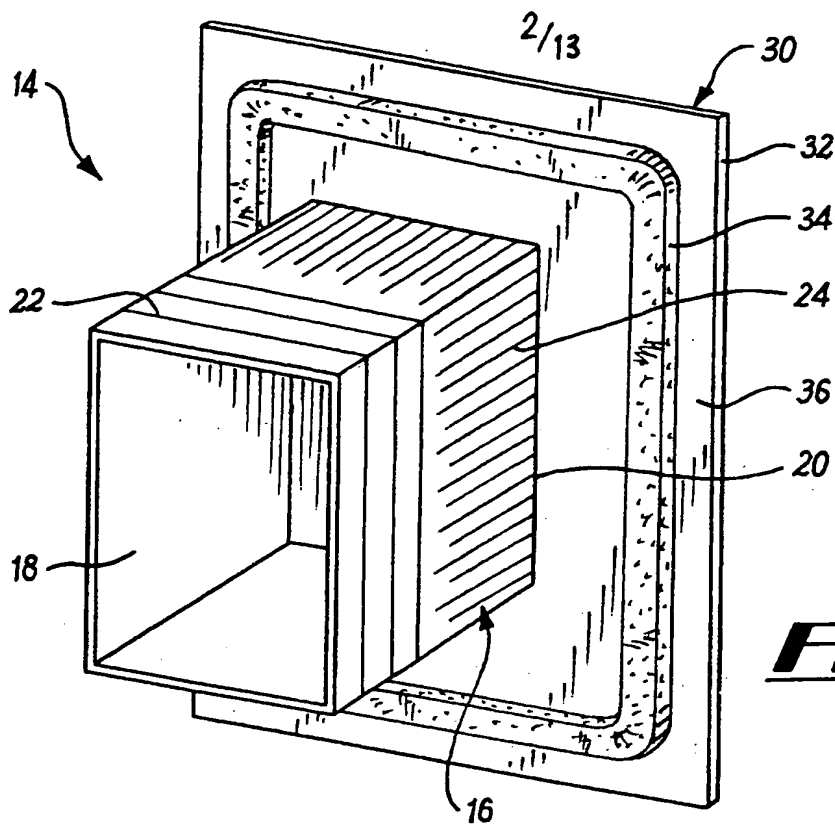


FIG 2

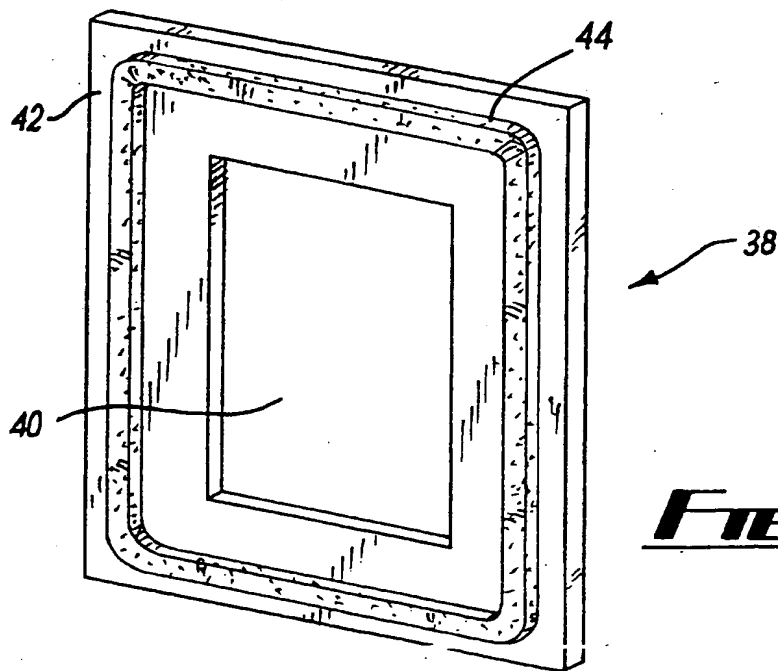
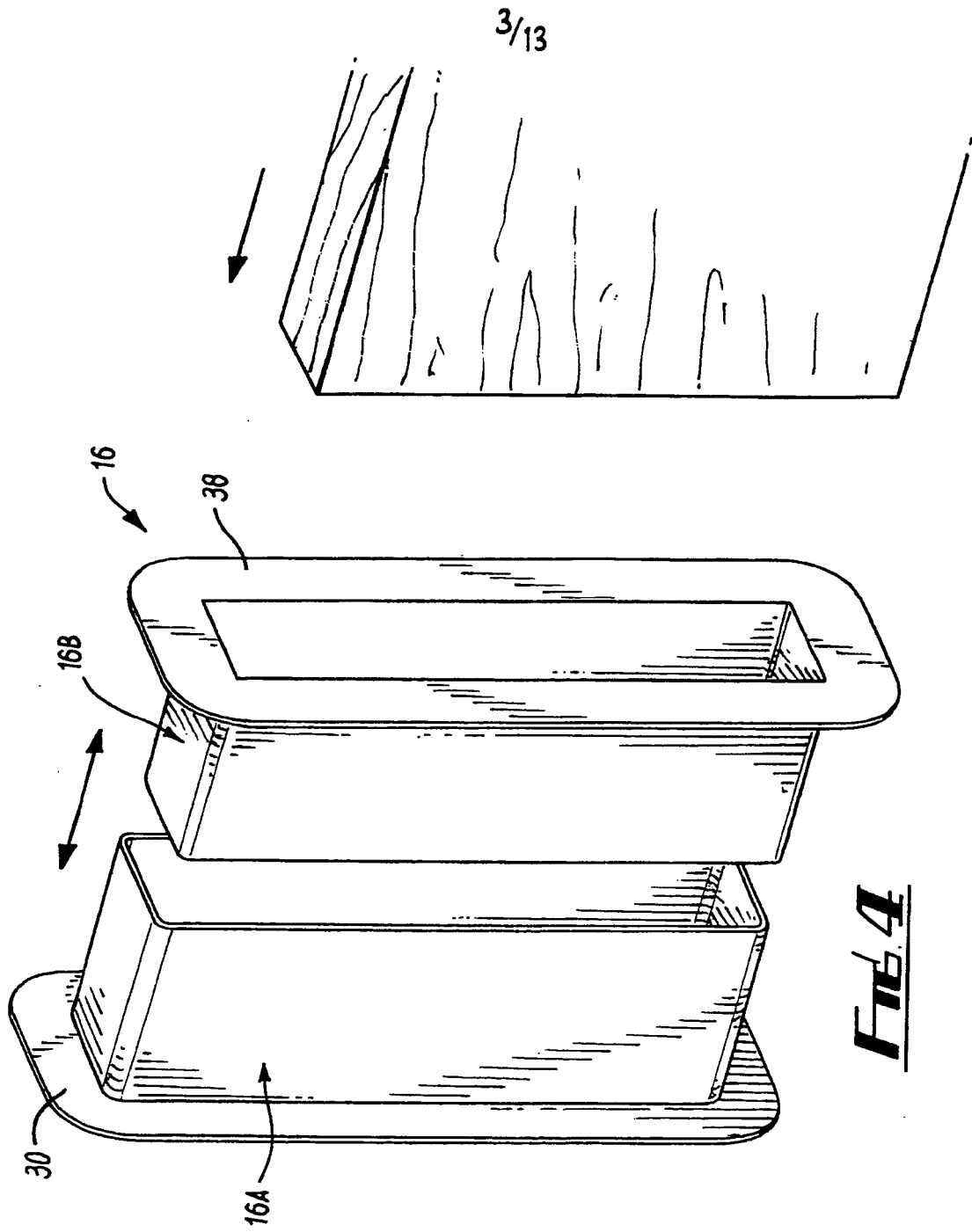


FIG 3

03 12 04



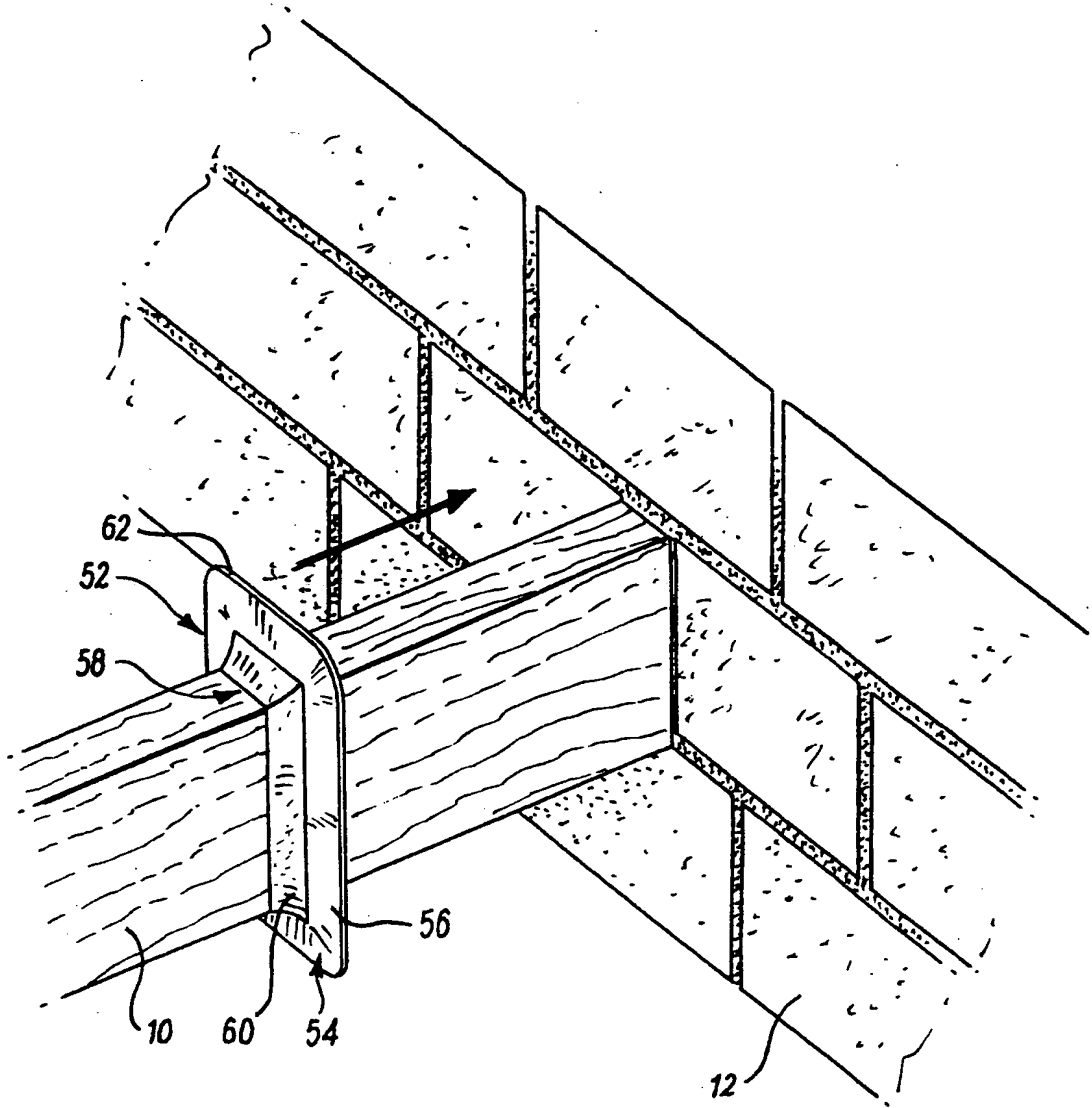


FIG. 5

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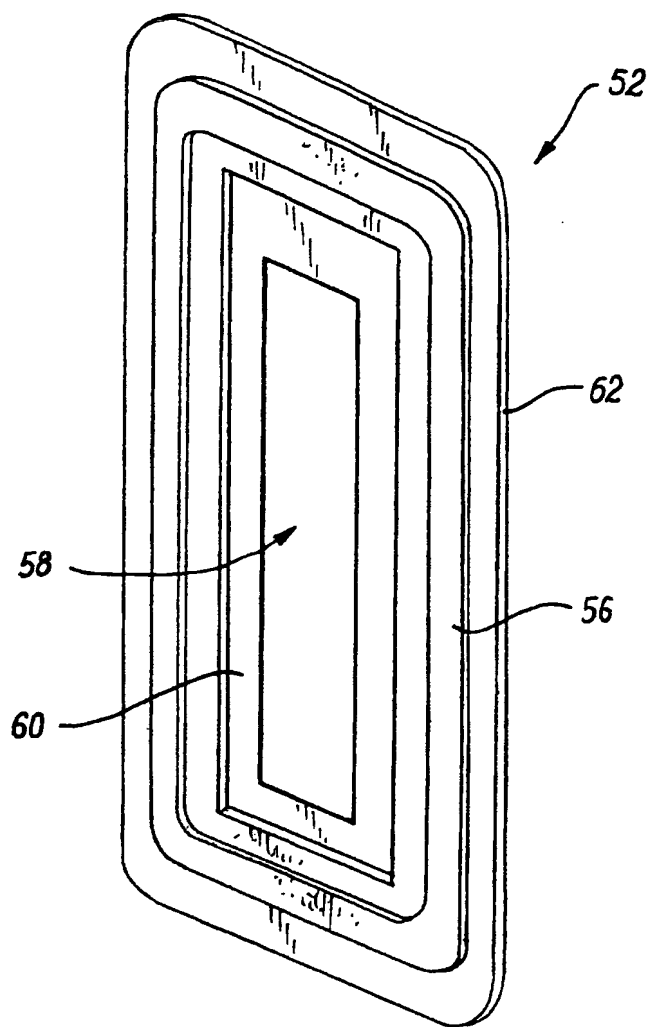


FIG. 6

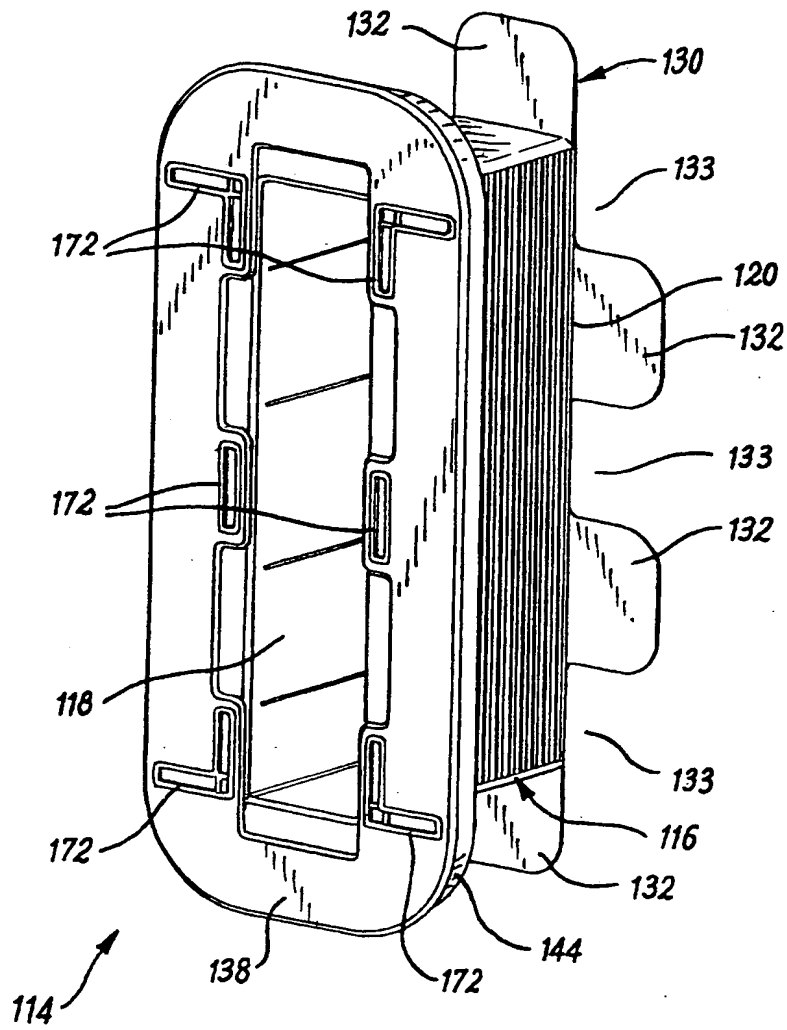
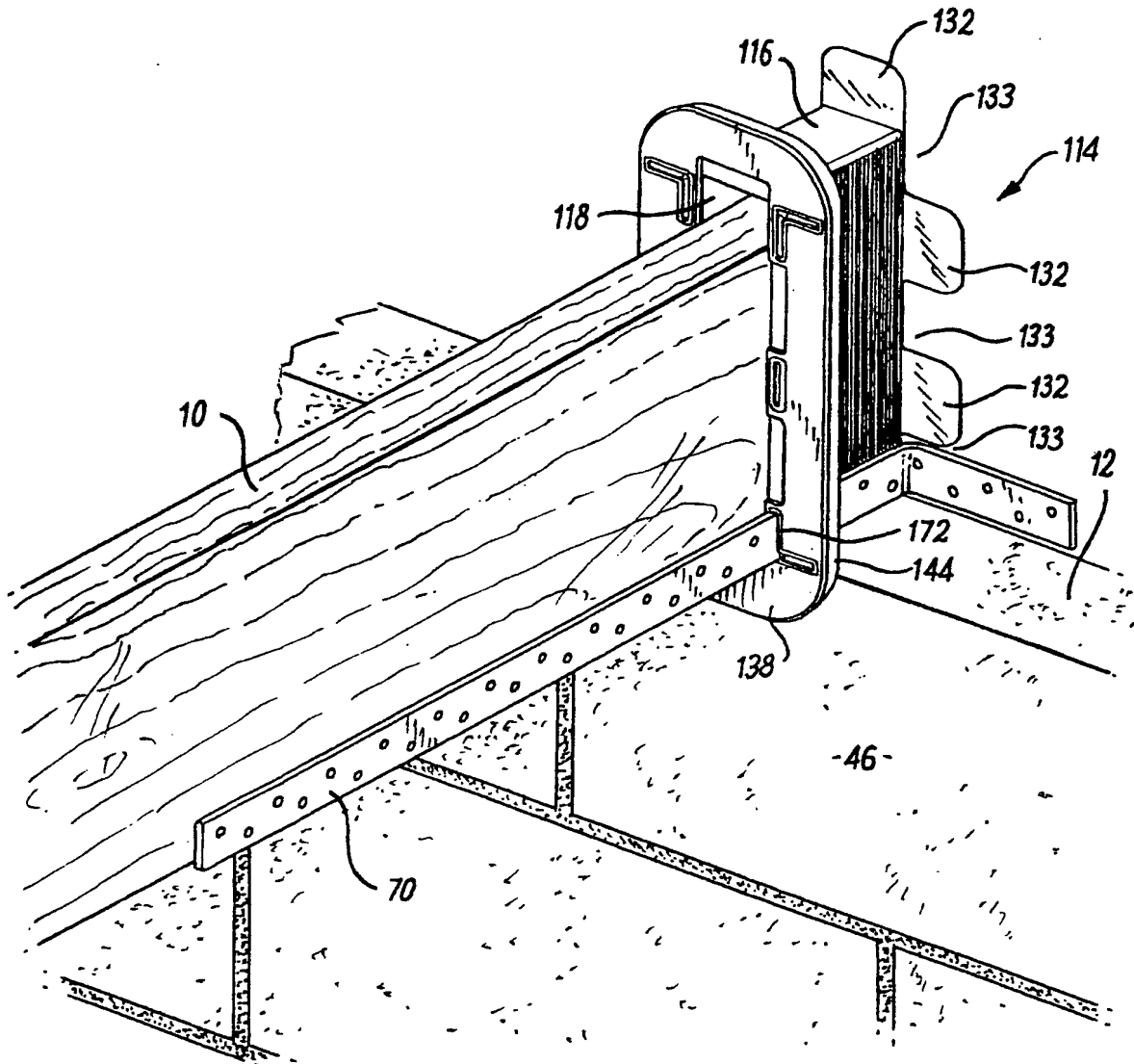


FIG. 1

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FIG. 8

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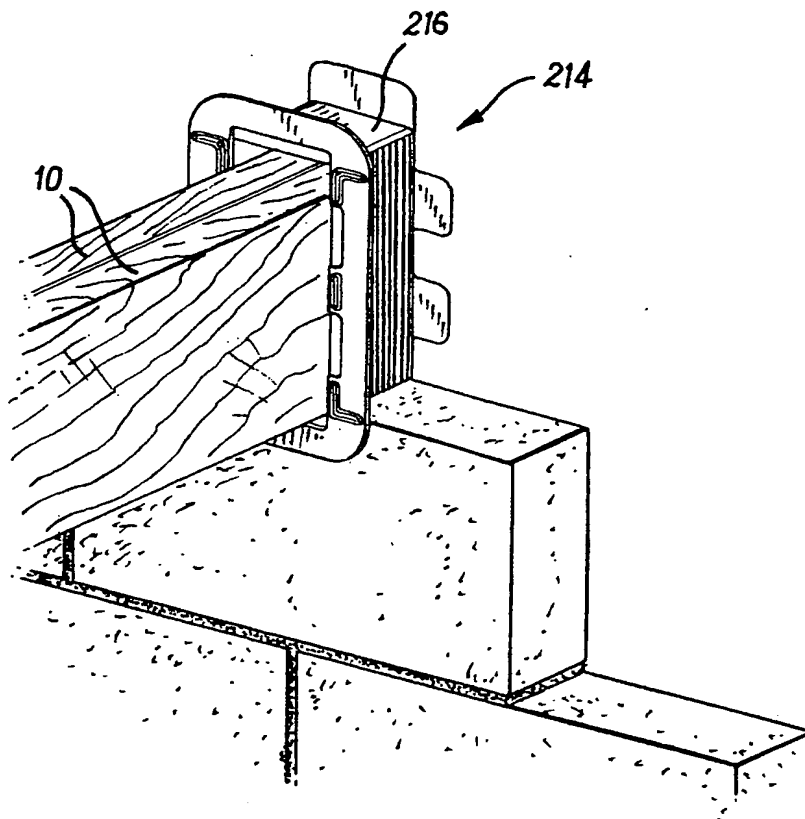
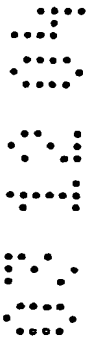


FIG 9



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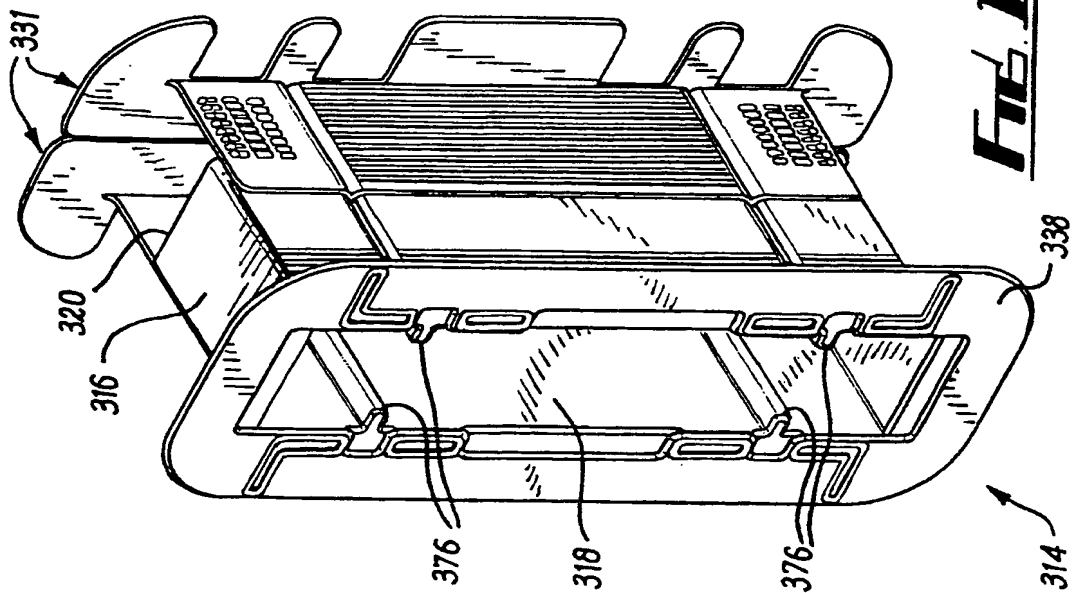


Fig. 10

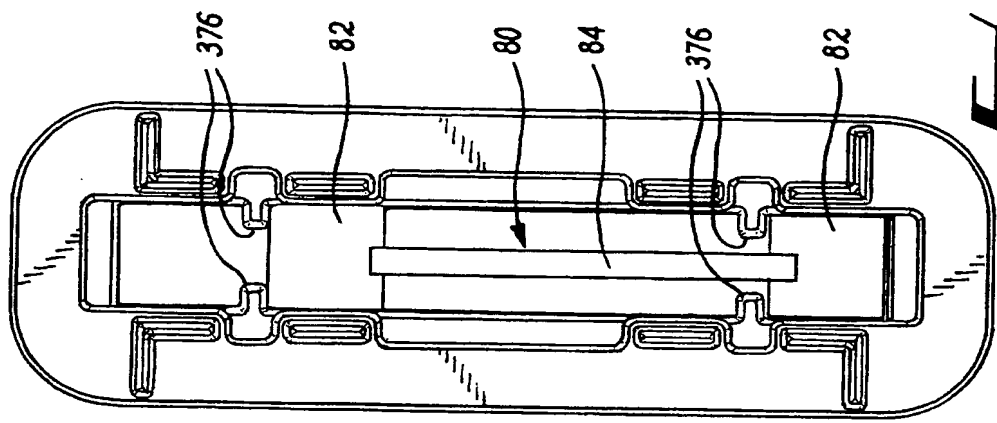


Fig. 11

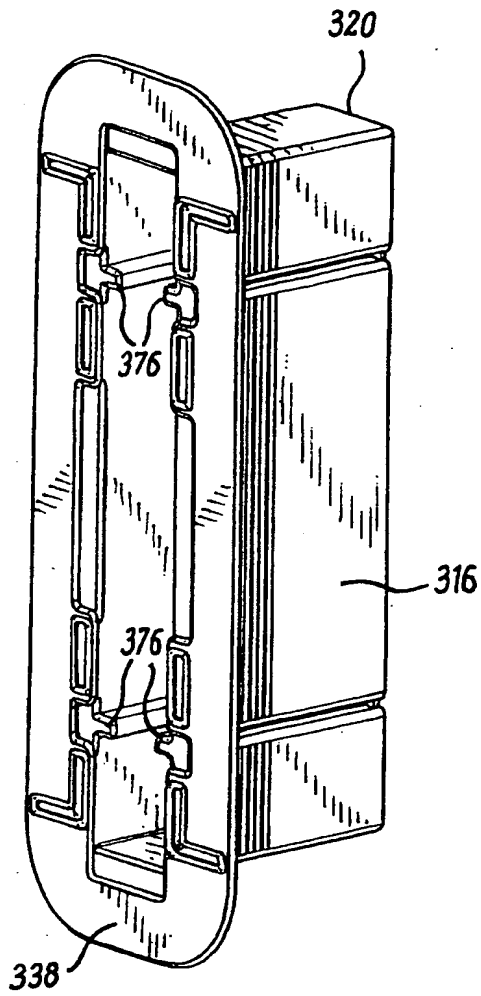


FIG. 12

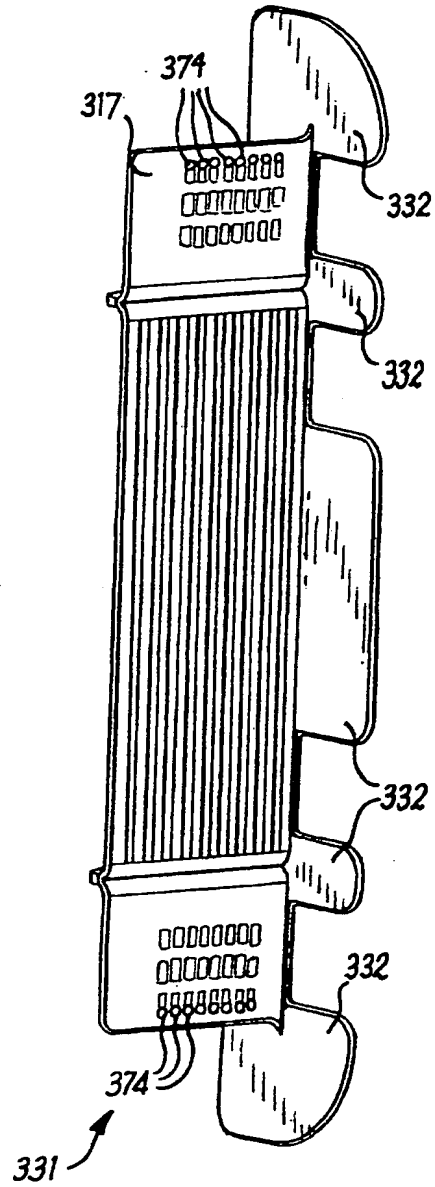


FIG. 13

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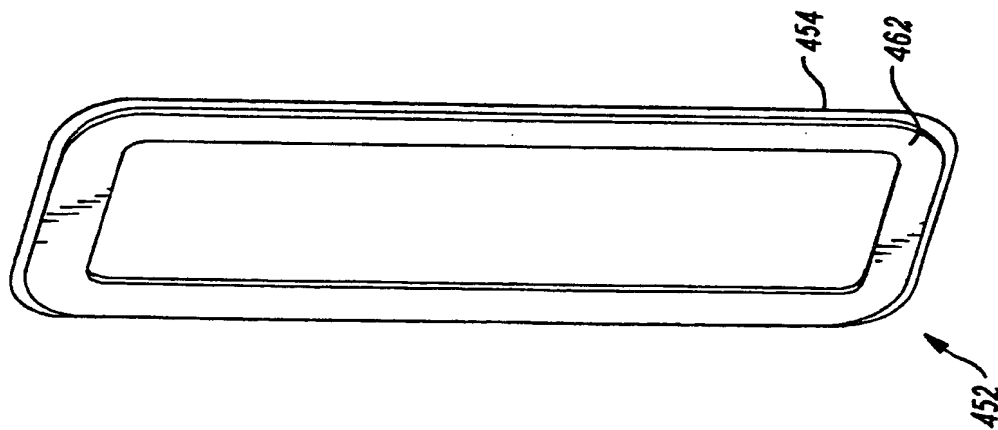


FIG. 14

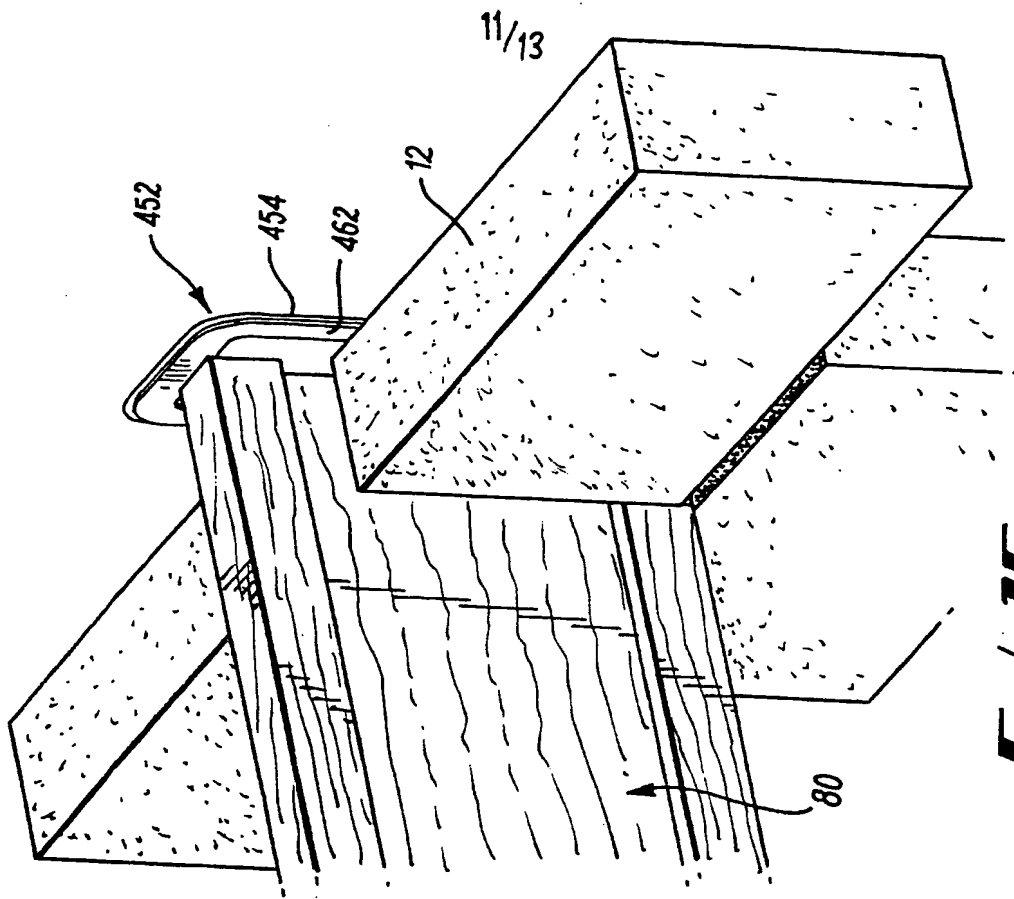
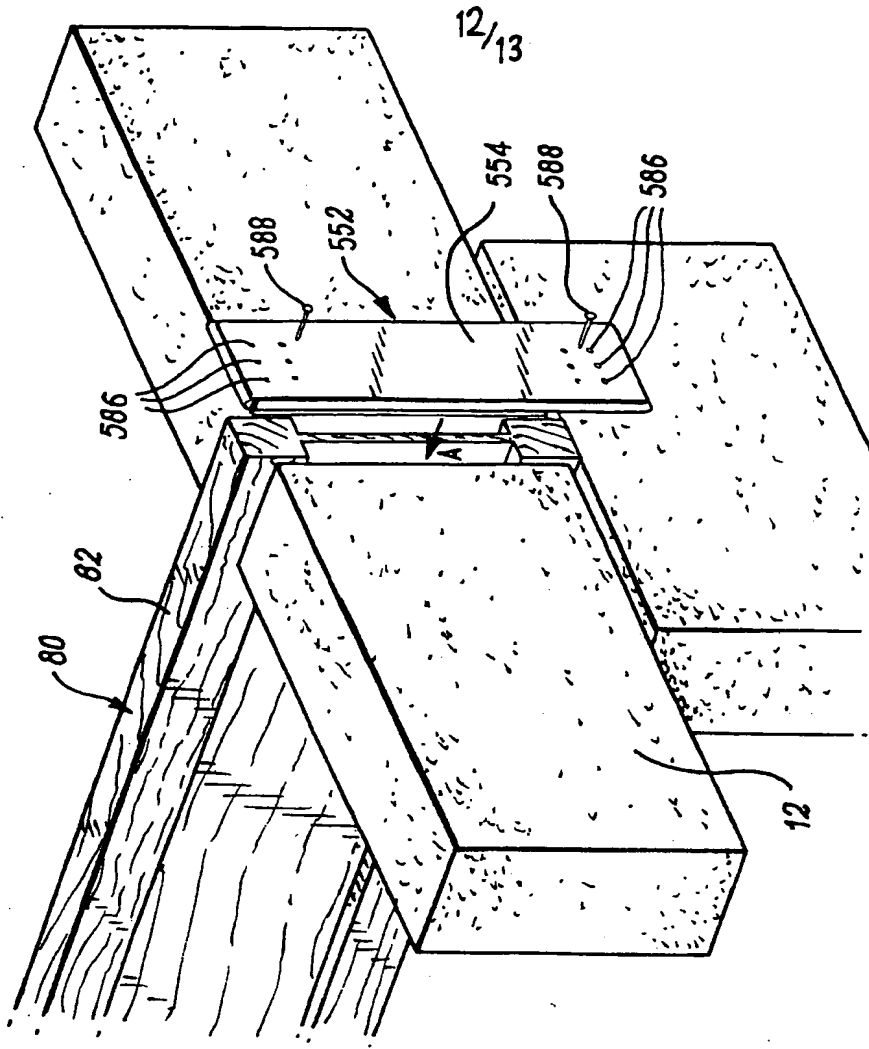
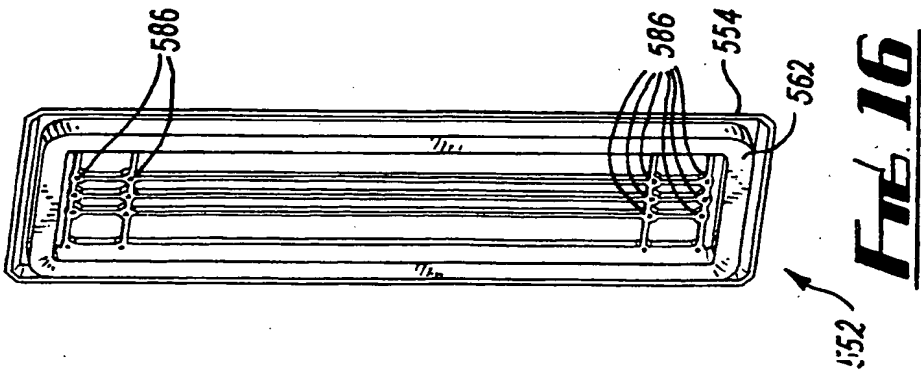


FIG. 15

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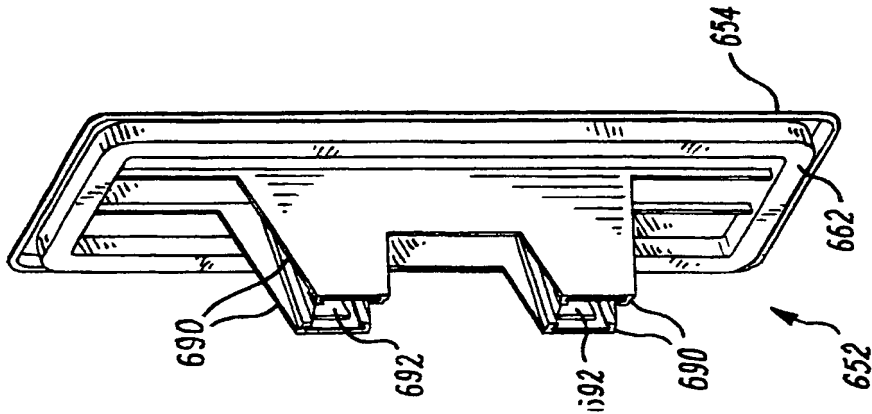


Fig. 18

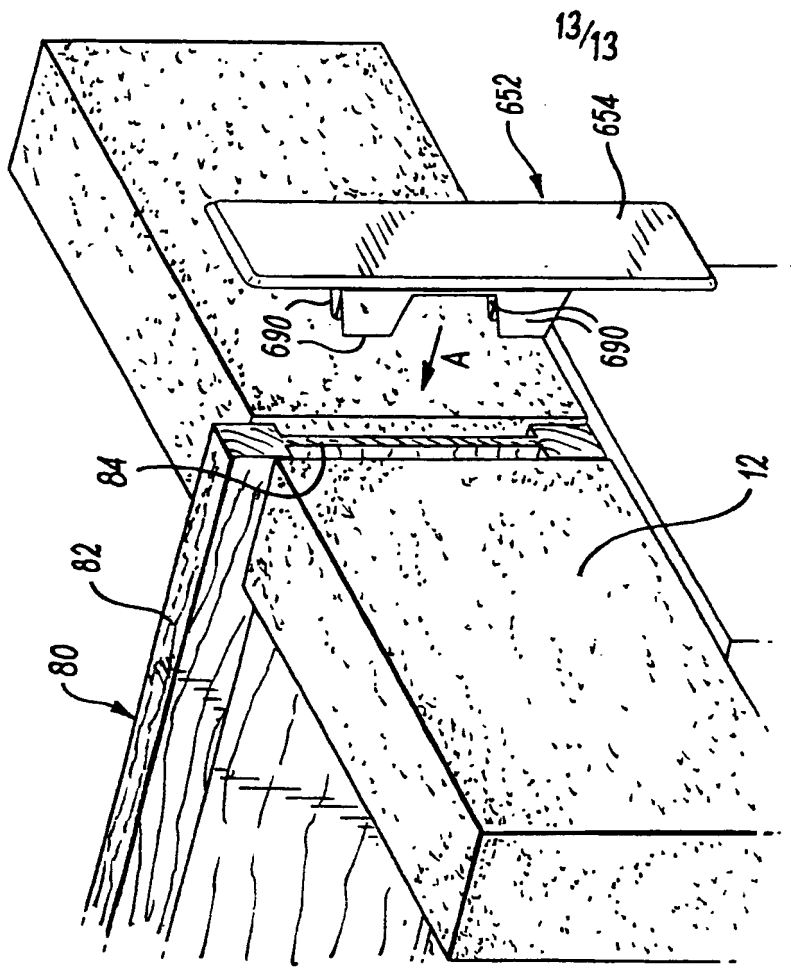


Fig. 19

Sealing Apparatus

Embodiments of the present invention relate to a sealing apparatus for mounting an end of a joist within a wall.

5

Joists are elongate timbers which are used to provide support for a floor in a building. Opposite ends of the joists are attached to walls of the building so that the joists bridge the space between the walls. Each joist end is conventionally built into the wall, which is typically the inner skin of a cavity wall.

10

Due to atmospheric conditions, a joist may shrink after it has been built into the wall. This can lead to small gaps being created around the joist through which air may pass. This may lead to heat loss from the building and a corresponding increase in energy consumption to replace the lost thermal energy.

15

According to the invention, there is provided a sealing apparatus for mounting an end of a joist within a wall, the sealing apparatus including a sleeve for receiving the end of the joist, the sleeve being configured for location within an aperture passing through the wall to thereby mount the joist within the wall, wherein the apparatus is configured such that a seal may be created between the sleeve and the wall, to substantially prevent the passage of air through the aperture from one side of the wall to an opposite side of the wall.

20



25

The aperture would typically be created by the sleeve being built into the wall, as the wall is constructed.



Preferably the sleeve has an open end for receiving the joist and an opposite closed end, so that air may not pass through the sleeve from one side of the wall to the opposite side. The sleeve is preferably shaped such that it fully encloses the joist end in an air tight manner, other than at its open end.

30

The wall may include an inner face on the one side of the wall and an outer face on the opposite side of the wall.

The sealing apparatus may include a flange member for sealing between the sleeve and the wall. Preferably, the flange member is configured for sealing to a face of the wall. The flange member may be formed integrally with or may be sealed to the sleeve.

5

The flange member may include a planar part which lies parallel to a face of the wall in use. The flange member may include a flexible sealing strip located on the planar part, for sealing the planar part to the face of the wall. The sealing strip may be resilient, and may be formed of a plastics material.

10

The sealing apparatus may include an inner flange member for sealing to the inner face of the wall. The planar part of the inner flange member may be shaped to surround and extend from the sleeve, and may include a central aperture for receiving the sleeve. The inner flange member may include a lip for contacting the sleeve and for sealing thereto. Alternatively, the inner flange member may be formed integrally with the sleeve.

15

The inner flange member may include an area which is arrangeable in use to receive a joist restraint strap. The area may comprise a material which is relatively weak in comparison with surrounding material so that a user can form an opening in the area. Alternatively, the area may be bounded by lines of weakness so that the material in the area can be removed from the inner flange member to form an opening.

20



25



The area may be rectangular, and may be elongate. The longitudinal axis of the area may be aligned substantially vertically in use, or may be aligned substantially horizontally in use. The inner flange member may include a plurality of joist restraint strap receiving areas.

30

The sealing apparatus may additionally or alternatively include an outer flange member for locating and/or sealing to the outer face of the wall. The outer flange member may close the end of the sleeve. The outer flange member may include a central portion which abuts against and closes the end of the sleeve, and a perimeter portion which extends from the sleeve and forms the planar part

for locating and/or sealing against the outer face of the wall. The outer flange member may be formed integrally with the sleeve.

Alternatively, the outer flange member may be formed in two parts, and each part may be substantially identical. Each outer flange part may include a sleeve engaging part, which in use is mounted to the sleeve. Each outer flange part may include a perimeter portion which extends from the sleeve engaging part and forms the planar part for locating and/or sealing against the outer face of the wall. Preferably the outer flange parts are mountable to the sleeve in a plurality of positions to permit the apparatus to be used with walls of different thicknesses.

The perimeter portion may be discontinuous, and may comprise a plurality of perimeter tabs. The tabs may be positioned so that spaces defined between the tabs correspond in use horizontally with the joist restraint strap receiving areas.

Preferably, the sealing apparatus includes both an inner and an outer flange member. Preferably, the inner flange member is spaced from the outer flange member by a dimension which is such that, in use, a wall in position between the inner and outer flange members compresses the resilient sealing strip.

The sleeve may be rectangular in cross-section, including parallel, spaced apart, upper and lower planar members and parallel spaced apart, side planar members which are perpendicular to and which join together the upper and lower planar members.

The sleeve may be configured to receive the ends of two joists arranged side by side.

The sleeve may include an inwardly projecting formation which may be in the form of a rib, and which in use may engage the end of the joist to

substantially prevent upward movement of the end of the joist. The sleeve may include a plurality of spaced inwardly projecting formations.

5 Preferably, the flange members are perpendicular to the upper and lower and the side planar members.

10 Preferably, the sealing apparatus is configured such that in use the closed end of the sleeve is substantially aligned with the outer face of the wall. The open end of the sleeve may be substantially aligned with the inner face of the wall, or may extend beyond the inner face of the wall.

15 In one embodiment of the invention, the sleeve is formed in two parts which are arranged telescopically such that the parts may slide relative to one another, thereby altering the distance between the inner and outer flange members. This enables the sealing apparatus to accommodate walls of differing thicknesses. Each part of the sleeve may be rectangular in cross-section.

20 As an alternative or in addition to the flange members, the sealing apparatus may include an adhesive means to adhere the sleeve to the wall. The sleeve may include a plurality of grooves provided on its outer surface to aid the adhesion of the adhesive means to the sleeve. The adhesive means may include cement.



25 The apparatus may further include a filler for filling a space within the sleeve, between the sleeve and a joist positioned within the sleeve. This feature may allow any size of joist to be inserted into the sleeve. Therefore, only one size of sleeve may be necessary to fit all sizes of joists. The filler may be polystyrene.

30 According to the invention, there is further provided a method of mounting an end of a joist in a wall, the method including the steps of:

providing a sealing apparatus according to any of the preceding definitions;

positioning the end of the joist in the sleeve;

locating the sealing apparatus in the wall such that the apparatus is positioned in an aperture which passes through the wall; and

sealing the apparatus to the wall, to substantially prevent the passage of air through the aperture from one side of the wall to an opposite side of the wall.

5

According to the invention, there is further provided a sealing apparatus for sealing between a joist and a wall including an aperture in which the joist is mounted, the sealing apparatus comprising a closure member and a sealing arrangement for sealing between the closure member and the wall, to thereby

10 substantially prevent air from passing through the aperture in which the joist is mounted, the sealing apparatus including mounting means for mounting the closure member to the joist or wall.

The closure member may include a generally planar body, the body being

15 configured such that it lies substantially perpendicular to the joist when the joist is located in the central opening.

The sealing arrangement may include a flexible sealing strip, which may be provided around an outer perimeter of the closure member, to seal against the

20 wall in use. The sealing strip may be resilient, and may be formed of a plastics material. The sealing arrangement may include adhesive, which may be formed as a layer over the sealing strip. Alternatively the sealing strip may comprise a sealing material with adhesive properties, and may comprise a mastic.

In one embodiment, the mounting means may comprise the adhesive

25 sealing strip or adhesive sealing material.

In another embodiment, the mounting means may comprise a weaker area or a plurality of weaker areas defined in the closure member, through which in

30 use a fastener such as a nail may be positioned to mount the closure member to the joist or wall.

In a further embodiment, the mounting means may comprise a pair of spaced gripping members. The gripping members may be arranged so that, in

use, the gripping members grip the joist, with one gripping member positioned on one side of the joist and the other gripping member positioned on an opposite side of the joist. The gripping members may be formed of or include resilient material. The gripping members may include barbs which substantially prevent
 5 removal of the sealing apparatus from the joist.

In yet another embodiment, the mounting means may comprise a central opening defined by the closure member through which, in use, the joist may pass.

10 The sealing apparatus may include a further sealing arrangement, which may include a flexible resilient material which is provided on an inner perimeter of the central opening, to contact and seal against the joist in use.

Alternatively, the further sealing arrangement may include a plurality of
 15 flexible members which extend from the closure member and contact the joist in use, to form a seal between the closure member and the joist. The flexible members may extend from closure member into the central opening.

For a better understanding of the present invention, reference will now be
 20 made by way of example only to the accompanying drawings, in which:



Fig. 1 is a diagrammatic perspective view of apparatus according to one embodiment of the present invention;



25 Fig. 2 is a diagrammatic perspective view of a sleeve suitable for use with the apparatus of Fig. 1;



Fig. 3 is a diagrammatic perspective view of a second sealing member suitable for use with the apparatus of Fig. 1;

30

Fig. 4 is a diagrammatic perspective view of apparatus according to a further embodiment of the invention;

Fig. 5 is a diagrammatic perspective view of apparatus according to the further embodiment of the invention in use;

Fig. 6 is a diagrammatic perspective view of the apparatus of Fig. 5;

5

Fig. 7 is a diagrammatic perspective view of another apparatus according to the invention;

Fig. 8 is a diagrammatic perspective view of the apparatus of figure 7 in use;

10

Fig. 9 is a diagrammatic perspective view of another apparatus according to the invention in use;

15

Fig. 10 is a diagrammatic perspective view of another apparatus according to the invention;

Fig. 11 is a diagrammatic perspective view from one side of the apparatus of figure 10 in use;

20



Fig. 12 is a diagrammatic perspective view of part of the apparatus of figure 10;



25

Fig. 13 is a diagrammatic perspective view of another part of the apparatus of figure 10;



Fig. 14 is a diagrammatic perspective view of another apparatus according to the invention;

30

Fig. 15 is a diagrammatic perspective view of the apparatus of figure 14 in use;

Fig. 16 is a diagrammatic perspective view of another apparatus according to the invention;

Fig. 17 is a diagrammatic perspective view of the apparatus of figure 16 in use;

5 Fig. 18 is a diagrammatic perspective view of another apparatus according to the invention;

Fig. 19 is a diagrammatic perspective view of the apparatus of figure 18 in use.

10 Referring to Fig. 1, there is illustrated one end of an elongate timber joist 10 which is used within a building to provide support for a raised floor. The end of the joist 10 is supported by a wall 12, which in this example is an inner skin of a cavity wall.

15 Conventionally, the ends of such joists are built directly into the inner skin of the cavity wall, thus providing a secure construction. However, if the joist end should shrink due to changing atmospheric conditions, the joist may come out of contact with its surrounding mortar and gaps may form around the joist end, between the joist and the remainder of the wall. These gaps may allow air to
20 pass from one side of the inner skin of the cavity wall to the other. This allows relatively warm air from the region of the inside of the house to pass to the cavity thereby leading to heat loss from the building.



25 Referring to Figs. 1 to 3, there is illustrated a sealing apparatus 14 for mounting the end of a joist 10 within a wall 12 in such a way that the passage of air through the wall is substantially prevented.



30 The sealing apparatus 14 includes a sleeve 16 for receiving the end of the joist 10. The sleeve 16 comprises a rectangular cross-section tube and includes an open end 18 for receiving the end of the joist. An opposite end 20 of the sleeve is closed, as described in more detail hereinafter. The sleeve 16 thereby defines a closed ended, sealed cavity for receiving the end of the joist 10.

The sleeve 16 is made up of parallel, spaced apart, upper and lower planar members 26 and parallel, spaced apart side planar members 28 which join the upper and lower planar members, thus defining the tube.

5 Referring to Fig. 2, the sleeve 16 may include a plurality of parallel notches 22, each extending around its exterior surface, and a plurality of parallel grooves 24, each extending along its exterior surface. The purpose of the notches 22 and grooves 24 is described hereinafter.

10 Referring again to Fig. 2, the sealing apparatus 14 further includes an outer flange member 30 which closes the end 20 of the sleeve 16. The outer flange member 30 is planar and lies perpendicular to both the upper and lower planar members 26 and the side planar members 28 of the sleeve 16. The outer flange member 30 abuts onto the end 20 of the sleeve 16, thereby closing the
15 sleeve, but is sized such that it extends beyond the dimensions of the sleeve, thereby forming a flange 32 extending around and away from the end 20 of the sleeve 16. A flexible sealing strip 34 is located on an inner face 36 of the flange, the strip 34 forming a square loop which extends around but is spaced from the end 20 of the sleeve 16.

20



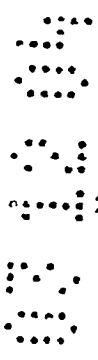
Referring to Fig. 3, the sealing apparatus 14 further includes an inner flange member 38 which is generally planar and which includes a central aperture 40 for receiving the sleeve 16. The inner flange member 38 may locate
25 in any one of the notches 22, formed on the exterior surface of the sleeve 16, and the central aperture 40 may include a lip (not illustrated) extending around its perimeter, for assisting such location. When so located, the inner flange member 38 extends around and away from the sleeve 16, perpendicular to the upper and lower and side planar members of the sleeve. The inner flange member 38 locates at or near the open end 18 of the sleeve 16. On a back face 42 of the
30 inner flange member, there is located a flexible sealing strip 44, the strip 44 forming a square loop which surrounds but is spaced from the sleeve 16. When the inner flange member 38 is located on the sleeve, the strip 42 faces towards the strip 34 on the outer flange member 30.

Referring again to Fig. 1, in use the sealing apparatus 16 is placed over the end of the joist 10, so that the sleeve 16 encases the joist end, and is built into the wall 12, thereby locating in an aperture which extends through the wall 12, from one (internal) side of the wall to an opposite (external) side of the wall.

5 The wall 12 includes an inner face 46 on the internal (room) side of the wall, and an outer face 48 on the external side of the wall.

The outer flange member 30 is positioned such that the sealing strip 34 seals against the outer face 48 of the wall. The inner flange member 38 (not shown in Fig. 1) is then positioned such that its sealing strip 44 seals against the inner face 46 of the wall. An adhesive means in the form of mortar is provided around the sleeve, and may key into the grooves 24, thus securing the sleeve in place within the wall. The sealing strip 44 seals the inner flange member 38 to the inner face 46 of the wall, thereby preventing any air passing from the internal side of the wall into the aperture in the wall. Additionally, the sealing strip 34 seals the outer flange member 30 to the outer face 48 of the wall, preventing any from air leaving the aperture in the wall to pass to the external side of the wall. Of course no air can pass through the sleeve 16 because the outer flange member 30 closes its end 20.

20



There is thus provided an apparatus which prevents the passage of air through the aperture which must be made in the wall 12 to house the end of the joist 10. The sleeve 16 is made of a material which does not expand or contract significantly under different atmospheric conditions. For example, plastic materials such as polypropylene are suitable. Thus, there is substantially no change in the dimensions of the sleeve 16 over time and a substantially permanent seal is provided between the sleeve and the wall. Further, because the inner and outer flange members 38, 30 are sealed to the inner and outer faces 46, 48 of the wall, thereby preventing the passage of any air through the aperture, if any gaps did form between the cover and the wall, no air could pass through these gaps.

30

Various modifications may be made to the above described embodiment without departing from the invention. For example, referring to Fig. 4, the sleeve

16 may be formed in two parts, a female part 16A and a male part 16B, which may slide telescopically relative to one another, the part 16B fitting inside the part 16A. In the illustrated embodiment, the outer flange 30 is integrally formed with the female part 16A and the inner flange 38 is integrally formed with the male part 16B. In other respects, the apparatus is as described previously with reference to Figs. 1 to 3. The parts 16A and 16B may be moved relative to one another, so that the outer flange 30 may contact and seal against the outer face 48 of the wall and the inner flange 38 may contact and seal against the inner face 48 of the wall.

In addition or alternatively, a filler may be inserted into the sleeve around a joist to accommodate different sizes of joist. The filler may be for example of polystyrene. The sleeves may be of any shape capable of housing an end of a joist and the flanges may be of any suitable shape for example, circular.

Figure 7 shows another sealing apparatus according to the invention, many features of which are similar to those described above for figures 1-4. Referring to figure 7, a sealing apparatus 114 includes a sleeve 116 for receiving the end of the joist 10. The sleeve 116 comprises a rectangular cross section tube and includes an open end 118 for receiving the end of the joist 10. An opposite end 120 of the sleeve 116 is closed by a substantially planar outer flange member 130. The outer flange member 130 includes a plurality of perimeter tabs 132 which extend outwardly away from the end 120 of the sleeve 116.

The sealing apparatus 114 further includes an inner flange member 138 which is generally planar and extends around and away from the open end 118 of the sleeve 116. On a back face of the inner flange member 138, there is located a flexible sealing strip 144, the strip 144 forming a loop which surrounds but is spaced from the sleeve 116, and is formed of a resilient plastics material such as a foam material.

The sleeve 116, the outer flange member 130, and the inner flange member 138 are, in the example shown in figure 7, formed in one piece of a plastics material such as polypropylene by moulding.

5 The inner flange member 138 includes a plurality of areas 172 in which the moulded plastics material is relatively thin and therefore relatively weak in comparison with the surrounding material of the inner flange member 138. The areas 172 are located adjacent to the open end 118 of the sleeve 116.

10 Figure 8 shows the sealing apparatus of Figure 7 in use. The sealing apparatus 114 is positioned on the wall 12 so that the wall 12 lies between the inner flange member 138 and the perimeter tabs 132. The sealing apparatus 114 is arranged so that the perimeter tabs 132 are spaced from the inner flange 138 such that when the wall 12 is in position between the perimeter tabs 132 and the
15 inner flange member 138, the sealing strip 144 is compressed by the wall 12. For example, typically a wall may have a width of 100 millimetres. The spacing between the perimeter tabs 132 and the inner flange member 138 could be 103 millimetres and the thickness of the sealing strip 144 could be approximately 7 millimetres so that in use, the sealing strip 144 is compressed.

20



25



The end of the joist 10 is positioned within the sleeve 116. An opening is formed in one of the weaker areas 172, and a joist restraint strap 70 passed through the opening formed. The perimeter tabs 132 are located so that spaces 133 defined between tabs 132 correspond in use horizontally with the weaker areas 172. The strap 70 can thus be positioned alongside the joist 10 passing through the opened weaker area 172, passing alongside the sleeve 116, passing through one of the spaces 133 between the tabs 132 to locate on an outer face of the wall 12. The weaker areas 172 are shaped to correspond closely to the cross-section of the strap 70, so that a seal is maintained.

30

The sealing apparatus 114 of figures 7 and 8 is simple to use since the sleeve and flanges are formed as a one piece unit. By being closely tailored to the width of the wall on which the sealing apparatus is to be used, the degree of skill required in achieving a good seal is reduced, so that a good quality seal can

be achieved easily. The apparatus allows the use of joist restraint straps as required in certain building situations.

Various modifications may be made without departing from the scope of the invention. The weaker areas could be of any suitable size and shape. The weaker areas could be bounded by lines of weakness, so that material in the area is pushed out of the inner flange member to form an opening.

Figure 9 shows another embodiment of the invention, which is a simple variation of the sealing apparatus shown in figures 7 and 8. Figure 9 shows a sealing apparatus 214 including a sleeve 216, the sleeve 216 arranged to receive the ends of two joists 10 arranged side by side. Such an arrangement is used where extra strength is required in the construction of the building, such as around stairwells.

Figures 10-13 show another embodiment of the invention, which is again a variation on the embodiment shown in figures 7 and 8. Figure 10 shows a sealing apparatus 314, including a sleeve 316 for receiving the end of the joist 10. The sleeve 316 includes an open end 318 for receiving the end of the joist. An opposite end 320 of the sleeve 316 is closed. The sealing apparatus 314 includes an inner flange member 338 which extends outwardly from the open end 318 of the sleeve 316. The sleeve 316 and inner flange member 338, as shown in figure 12 are formed in one piece by moulding.

Figure 13 shows an outer flange part 331, which is formed as a single moulding, the outer flange part 331 including a plurality of spaced perimeter tabs 332 extending from a substantially planar sleeve engaging part 317. The plane of the sleeve engaging part 317 is substantially perpendicular to the plane in which the perimeter tabs 332 lie. A plurality of guide markings 374 are provided on the sleeve engaging part 317.

Prior to installation in a wall, the sealing apparatus 314 is assembled as follows. A pair of outer flange parts 331 are mounted to the sleeve 316, the sleeve engaging part 317 of each outer flange part 331 being mounted to

opposite sides of the sleeve 316. The outer flange parts 331 can be mounted in a variety of positions along the sleeve 316, thus varying the distance between the perimeter tabs 332 and the inner flange member 338, permitting use of the sealing apparatus 314 with walls of different thicknesses. The sleeve engaging part 317 of each outer flange member part 331 is mounted to the sleeve 316 by any convenient means such as adhesive or plastic welding. The guide markings 374 guide the user in mounting the outer flange member parts 331 in the correct position on the sleeve 316, according to the thickness of the wall with which the sealing apparatus is to be used.

Figure 10 shows the sealing apparatus 314 ready for installation. In this assembled condition, the perimeter tabs 332 of each of the outer flange member parts 331 lie substantially in the same plane.

The sealing apparatus 314 shown in figures 10-13 allows the provision of a wide range of sealing apparatus suitable for walls of different thickness, while requiring relatively few, simple moulded parts. The provision of the outer flange in two parts allows use of the outer flange parts with sleeves suitable for use with joists of differing widths or multiple joists, for example as shown in figure 9.

The sleeve 316 of the sealing apparatus 314 includes a plurality of parallel, spaced, inwardly projecting formations in the form of ribs, each of which extends from the open end 318 of the sleeve towards the closed end 320 of the sleeve 316. In use, the ribs extend horizontally.

Figure 11 shows an outline of a joist in position in the sleeve 316. In the example shown in figure 11, the joist is a type of joist known as a timber engineered joist. Such joists comprise a pair of parallel flanges 82, a web 84 extending between the flanges, the flanges 82 being wider than the web 84. Such joists are available in a number of different sizes. Typically, the flanges 82 of different sized joists are substantially identical, the joists differing in the height of the web between the flanges.

In the example shown in figure 11, the end of the joist 80 is received in the sleeve 316. The ribs 376 are positioned within the sleeve 316 so that the lowermost of the flanges 82 locates beneath the lowermost pair of ribs 376 and the uppermost of the flanges 82 locates beneath the upper most ribs 376 thus substantially preventing upward movement of the end of the joist 80. However, it will be apparent that instead of the joist 80 shown in figure 11, a larger joist could be accommodated within the sleeve 316. As previously, the lowermost flange of the larger joist could locate below the lower most ribs 376, but the uppermost flange of the larger joist would locate above the uppermost ribs 376.

It will be apparent to the skilled man that various of the features shown in the embodiments described above and shown in Figs 1 to 4 and Figs 7 to 13 could be used in any of those embodiments. For instance, any of the embodiments described above could be provided with weaker areas and corresponding spaces in the outer flange to permit the use of joist restraint straps. Any of the sleeves shown could be provided with or without ribs depending on the joist type for which the sealing apparatus is to be used.

Figs. 5 and 6 illustrate an alternative embodiment of the invention. Referring to Fig. 5, a sealing apparatus 52 is provided for sealing between a joist 10 and a wall 12. The sealing apparatus includes a closure member 54 having a generally planar body 56 provided with a mounting means in the form of a central opening 58 defined by the closure member 54. The central opening 58 is adapted to receive the joist 10 and when it does so, the planar body extends outwardly from the joist approximately perpendicular thereto.

The sealing apparatus 52 includes a sealing arrangement in the form of an adhesive seal 62 which extends around the outer perimeter of the body 56 of the closure member 54. This adhesive seal 62 is able to seal against the wall 10 when the sealing apparatus 52 is pushed against the wall in the direction indicated by the arrow in Fig. 5.

The sealing apparatus 52 includes a further sealing arrangement in the form of a flexible resilient rubber seal 60 for sealing between the closure member

54 and the joist. The flexible rubber seal 60 surrounds the inner perimeter of the central opening 58 in the closure member. The rubber of the seal 60 is sufficiently resilient that it can seal around the joist 10 even if it is of uneven shape or if it expands or contracts due to weather conditions.

5

There is thus provided a sealing apparatus which prevents the passage of air through the aperture which must be formed in the wall 12 in order to accommodate the joist.

10

Various modifications may be made to this embodiment without departing from the scope of the invention. For example, instead of the flexible rubber seal for sealing against the joist 10, the seal could consist of a number of flexible members extending inwardly from the inner perimeter of the opening, to contact and seal against the joist 10.

15

Figure 14 shows another embodiment according to the invention. A sealing apparatus 452 includes a generally planar closure member 454. The sealing apparatus 452 includes a sealing arrangement in the form of an adhesive seal 462 such as a mastic which extends around the outer perimeter of the closure member 454.

20

Figure 15 shows the sealing arrangement 452 in use. The sealing arrangement 452 is simply pressed into position over the joist 80. The sealing arrangement 452 is arranged so that the adhesive seal 462 is applied to the wall 12 surrounding the joist 80, and is further arranged so that the closure member 454 and the adhesive seal 462 accommodate any unevenness in the surrounding wall 12. For example, the closure member 454 could be flexible, and/or the adhesive seal could be flexible.

25

In this embodiment, the sealing arrangement could comprise a flexible resilient sealing strip of plastics foam material to which an adhesive layer has been applied.

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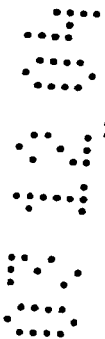


Figure 16 shows another embodiment according to the invention. A sealing apparatus 552 includes a substantially planar closure member 554 and a sealing arrangement in the form of a resilient, flexible sealing strip 562 which extends around the outer perimeter of the closure member 554. The sealing strip 562 is formed of a plastics foam material. The sealing apparatus 552 includes mounting means in the form of a plurality of weaker areas 586 defined in the closure member 554. In the weaker areas 586, the thickness of the material is relatively thinner than in the surrounding areas of the closure member 554, so that the weaker areas 586 are relatively easy to penetrate with a fastener such as a nail 588.

Figure 17 shows the sealing apparatus 552 in use. The sealing apparatus 552 is placed over the end of the joist 80 as indicated by arrow A so that the sealing strip 562 seals against the wall 12 surrounding the end of the joist 80. A plurality of nails 588 are then located through the weaker areas 586 into the end of the joist 80. The plastics material of the closure member 554 substantially seals around the nails 588. The weaker areas 586 are positioned to correspond with the locations of the flanges 82 of the joist 80. The weaker areas 586 are arranged to be visible to a user in use.

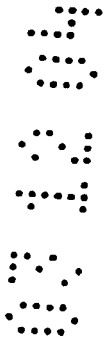
Figure 18 shows another embodiment according to the invention. Sealing apparatus 652 includes a substantially planar closure member 654 and a sealing arrangement in the form of a flexible, resilient sealing strip 662 which extend around the outer perimeter of the closure member 654. The sealing apparatus 652 includes mounting means in the form of two pairs of spaced, opposed gripping members 690 projecting from the plane of the closure member 654 within the sealing strip 662. Each of the gripping members 690 is provided with a resilient, inwardly directed projection 692, which could for example be formed of spring steel.

Figure 19 shows the sealing apparatus 652 in use. The sealing apparatus 652 is pushed into position as indicated by arrow A over the end of the joist 80 so that the gripping member 690 grip the web 84 of the joist 80, one member of each of the pairs of gripping members 690 being positioned on one side of the

joist and the other member being positioned on an opposite side. The resilient projections 692 deform against the web 84 to grip the web 84 and prevent displacement of the sealing apparatus 652. As with previous embodiments, the sealing strip 662 seals against the adjacent wall 12 surrounding the end of the joist 80.

Various modifications may be made without departing from the scope of this embodiment. The sealing apparatus could be arranged for use with a traditional rectangular section joist. The gripping members could be formed of a resilient material. Any suitable resilient material could be used. Alternatively or additionally, the gripping members could include barbs, which allow placement of the sealing apparatus over the end of the joist, but substantially prevent removal of the sealing apparatus from the joist.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.



CLAIMS

1. A sealing apparatus for mounting an end of a joist within a wall, the sealing apparatus including a sleeve for receiving the end of the joist, the sleeve being
5 configured for location within an aperture passing through the wall to thereby mount the joist within the wall, wherein the apparatus is configured such that a seal may be created between the sleeve and the wall, to substantially prevent the passage of air through the aperture from one side of the wall to an opposite side of the wall.
- 10 2. Apparatus according to claim 1, in which the sleeve has an open end for receiving the joist and an opposite closed end, so that air may not pass through the sleeve from one side of the wall to the opposite side.
- 15 3. Apparatus according to claim 2, in which the sleeve is shaped such that it fully encloses the joist end in an air tight manner, other than at its open end.
4. Apparatus according to any of claims 1 to 3, in which the sealing apparatus includes a flange member for sealing between the sleeve and the wall.
- 20 5. Apparatus according to claim 4, in which the flange member is configured for sealing to a face of the wall.
6. Apparatus according to claims 4 or 5, in which the flange member is
25 formed integrally with the sleeve.
7. Apparatus according to claims 4 or 5, in which the flange member is sealed to the sleeve.
- 30 8. Apparatus according to any of claims 4 to 7, in which the flange member includes a planar part which lies parallel to a face of the wall in use.

9. Apparatus according to claim 8, in which the flange member includes a flexible sealing strip located on the planar part, for sealing the planar part to the face of the wall.

5 10. Apparatus according to claim 9, in which the sealing strip is resilient.

11. Apparatus according to any of claims 4 to 10, in which the sealing apparatus includes an inner flange member for sealing to an inner face of the wall.

10

12. Apparatus according to claim 11 when dependent on any of claims 8 to 10, in which the planar part of the inner flange member is shaped to surround and extend from the sleeve, and includes a central aperture for receiving the sleeve.

15 13. Apparatus according to claims 11 or 12 when dependent on claim 7 and any claim dependent thereon, in which the inner flange member includes a lip for contacting the sleeve and for sealing thereto.

20 14. Apparatus according to claims 11 or 12 when dependent on claim 6 and any claim dependent thereon, in which the inner flange member is formed integrally with the sleeve.

25 15. Apparatus according to any of claims 11 to 14, in which the inner flange member includes an area which is arrangeable in use to receive a joist restraint strap.

30 16. Apparatus according to claim 15, in which the area comprises a material which is relatively weak in comparison with surrounding material so that a user can form an opening in the area.

17. Apparatus according to claim 15, in which the area is bounded by lines of weakness so that material in the area can be removed from the inner flange member to form an opening.

18. Apparatus according to any of claims 4 to 17, in which the sealing apparatus includes an outer flange member for locating and/or sealing to the outer face of the wall.

5 19. Apparatus according to claim 18, in which the outer flange member closes the end of the sleeve.

10 20. Apparatus according to claim 19 when dependent on claim 8 and any claim dependent thereon, in which the outer flange member includes a central portion which abuts against and closes the end of the sleeve, and a perimeter portion which extends from the sleeve and forms the planar part for locating and/or sealing against the outer face of the wall.

15 21. Apparatus according to any of claims 18 to 20 when dependent on claim 6 and any claim dependent thereon, in which the outer flange member is formed integrally with the sleeve.

20 22. Apparatus according to claims 18 or 19 when dependent on any of claims 4, 5 and 7 to 17, in which the outer flange member is formed in two parts.

23. Apparatus according to claim 22, in which each part is substantially identical.

25 24. Apparatus according to claim 23, in which each outer flange part includes a sleeve engaging part, which in use is mounted to the sleeve.

30 25. Apparatus according to claim 24 when dependent on claim 8 and any claim dependent thereon, in which each outer flange part includes a perimeter portion which extends from the sleeve engaging part and forms the planar part for locating and/or sealing against the outer face of the wall.

26. Apparatus according to any of claims 22 to 25, in which the outer flange parts are mountable to the sleeve in a plurality of positions to permit the apparatus to be used with walls of different thicknesses.

27. Apparatus according to claim 20 or claim 25 and any claim dependent thereon, in which the perimeter portion is discontinuous.

5 28. Apparatus according to claim 27, in which the perimeter portion comprises a plurality of perimeter tabs.

29. Apparatus according to claim 28 when dependent on claim 15 and any claim dependent thereon, in which the tabs are positioned so that spaces defined
10 between the tabs correspond in use horizontally with the joist restraint strap receiving areas.

30. Apparatus according to claims 11 and 18 and any claim dependent thereon, in which the sealing apparatus includes both an inner and an outer
15 flange member.

31. Apparatus according to claim 30 when dependent on claim 10 and any claim dependent thereon, in which the inner flange member is spaced from the outer flange member by a dimension which is such that, in use, a wall in position
20 between the inner and outer flange members compresses the resilient sealing strip.

32. Apparatus according to any of the preceding claims, in which the sleeve is rectangular in cross-section, including parallel, spaced apart, upper and lower
25 planar members and parallel spaced apart, side planar members which are perpendicular to and which join together the upper and lower planar members.

33. Apparatus according to any of the preceding claims, in which the sleeve is configured to receive the ends of two joists arranged side by side.

30 34. Apparatus according to any of the preceding claims, in which the sleeve includes an inwardly projecting formation.

35. Apparatus according to claim 34, in which the inwardly projecting formation is in the form of a rib.

5 36. Apparatus according to claim 35, in which the rib in use engages the end of the joist to substantially prevent upward movement of the end of the joist.

37. Apparatus according to any of claims 34 to 36, in which the sleeve includes a plurality of spaced inwardly projecting formations.

10 38. Apparatus according to claim 2 and any claim dependent thereon, in which the sealing apparatus is configured such that in use the closed end of the sleeve is substantially aligned with the outer face of the wall.

15 39. Apparatus according to claim 2 and any claim dependent thereon, in which the open end of the sleeve is substantially aligned with the inner face of the wall, or extends beyond the inner face of the wall.

20 40. Apparatus according to any of the preceding claims, in which the sleeve is formed in two parts which are arranged telescopically such that the parts are slidable relative to one another.

41. Apparatus according to any of the preceding claims, in which the sealing apparatus includes an adhesive means to adhere the sleeve to the wall.

25 42. Apparatus according to claim 41, in which the sleeve includes a plurality of grooves provided on its outer surface to aid the adhesion of the adhesive means to the sleeve.

30 43. Apparatus according to any of the preceding claims, in which the apparatus further includes a filler for filling a space within the sleeve, between the sleeve and a joist positioned within the sleeve.

44. A method of mounting an end of a joist in a wall, the method including the steps of:

providing a sealing apparatus according to any of the preceding claims;
positioning the end of the joist in the sleeve;

locating the sealing apparatus in the wall such that the apparatus is
positioned in an aperture which passes through the wall; and

5 sealing the apparatus to the wall, to substantially prevent the passage of
air through the aperture from one side of the wall to an opposite side of the wall.

45. A sealing apparatus for sealing between a joist and a wall including an
aperture in which the joist is mounted, the sealing apparatus comprising a closure
10 member and a sealing arrangement for sealing between the closure member
and the wall, to thereby substantially prevent air from passing through the
aperture in which the joist is mounted, the sealing apparatus including mounting
means for mounting the closure member to the joist or wall.

15 46. Apparatus according to claim 45, in which the closure member includes a
generally planar body, the body being configured such that it lies substantially
perpendicular to the joist when the joist is located in the opening.

47. Apparatus according to claims 45 or 46, in which the sealing arrangement
20 includes a flexible sealing strip.

48. Apparatus according to claim 47, in which the flexible sealing strip is
provided around an outer perimeter of the closure member, to seal against the
wall in use.

25 49. Apparatus according to claims 47 to 48, in which the sealing strip is
resilient.

50. Apparatus according to any of claims 45 to 49, in which the sealing
30 arrangement includes adhesive.

51. Apparatus according to claim 50 when dependent on any of claims 47 to
49, in which the adhesive is formed as a layer over the sealing strip.

52. Apparatus according to any of claims 47 to 49, in which the sealing strip comprises a sealing material with adhesive properties.
53. Apparatus according to claim 52, in which the sealing strip comprises a mastic.
54. Apparatus according to any of claims 50 to 53, in which the mounting means comprises the adhesive sealing strip or adhesive sealing material.
55. Apparatus according to any of claims 45 to 54, in which the mounting means may comprise a weaker area or a plurality of weaker areas defined in the closure member, through which in use a fastener such as a nail is positionable to mount the closure member to the joist or wall.
56. Apparatus according to any of claims 45 to 55, in which the mounting means comprises a pair of spaced gripping members.
57. Apparatus according to claim 56, in which the gripping members are arranged so that, in use, the gripping members grip the joist, with one gripping member positioned on one side of the joist and the other gripping member positioned on an opposite side of the joist.
58. Apparatus according to claims 56 or 57, in which the gripping members are formed of or include resilient material.
59. Apparatus according to any of claims 56 to 58, in which the gripping members include barbs which substantially prevent removal of the sealing apparatus from the joist.
60. Apparatus according to any of claims 45 to 59, in which the mounting means comprises a central opening defined by the closure member through which, in use, the joist may pass.

61. Apparatus according to claim 60, in which the sealing apparatus includes a further sealing arrangement.

5 62. Apparatus according to claim 61, in which the further sealing arrangement includes a flexible resilient material which is provided on an inner perimeter of the central opening, to contact and seal against the joist in use.

10 63. Apparatus according to claim 61, in which the further sealing arrangement includes a plurality of flexible members which extend from the closure member and contact the joist in use, to form a seal between the closure member and the joist.

15 64. Apparatus according to claim 63, in which the flexible members extend from the closure member into the central opening.

65. Sealing apparatus substantially as hereinbefore described and with reference to the accompanying drawings.

20 66. A method of mounting an end of a joist in a wall substantially as hereinbefore described and with reference to the accompanying drawings.

25 67. Any novel subject matter or combination including novel subject matter disclosed herein, whether or not within the scope of or relating to the same invention as any of the preceding claims.



Application No: GB0409075.9

Examiner: J D Cantrell

Claims searched: 1 - 44

Date of search: 4 January 2005

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X,E	1 - 8, 18 -21, 32, 34, 35, 37, 38, 44	GB2395207 A POLYPIPE (Whole document)
X,E	1 - 8, 18 -21, 38,44	GB2394234 A VAUGHAN (Whole document)
X,P	1 - 8, 11, 12, 14 - 17, 32,34, 35, 37 - 39, 42 - 44	GB2393459 A SIMPSON (whole document)
X	1 - 8, 11, 14, 18 - 21, 32, 34 - 39, 44	GB1564752 A GRINDROD (whole document)
X	1 -8, 11, 14, 32,39,44	GB 525650 A KEILLOR (whole document)

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